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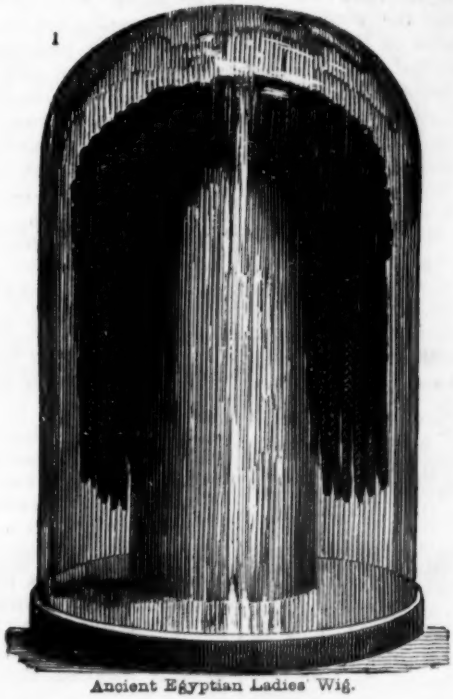
ON WIGS AND HEAD-DRESSES.

2 Roman Lady.



1 Ancient Egyptian Ladies' Wig.

4 Queen of Chas. I. of England.

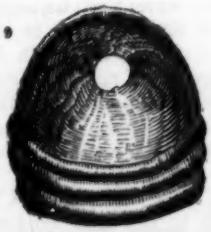
3 Queen of Henry IV. of France

5 Queen of Henry IV. of France.

6 Perruque a deux Queues.

7 Perruque Naissante.

8 Perruque a la Brigadiere.



9 Perruque a l'Abbe.

10 Perruque en Bonnet.

11 Perruque a Nœuds

ON WIGS AND HEAD-DRESSES.

No. I.

The custom of wearing false hair is of much more ancient date than is usually imagined; several of the nations of antiquity, when their riches and luxury were at the highest, were in the habit of adorning their persons by the addition of artificial tresses. It is likely that the ancient Babylonians employed the assistance of art in the arrangement of their hair, and perhaps wigs were not unknown to the fashionables of that day. That the art of wig-making had made considerable progress among the ancient Egyptians we are led to infer from the accounts of ancient historians, and the remains of Egyptian art which have been from time to time discovered; but the matter is now beyond all doubt, a perfect wig, which once belonged to an Egyptian lady, perhaps three thousand years ago, having been found in a tomb in the small temple of Isis at Thebes, in Egypt. This curious relic of antiquity, of which we give an engraving (No. 1,) is now to be seen among the remains of Egyptian art in the British Museum; its workmanship is excellent, and would not disgrace a modern *pérruquier*. The crown of the wig, as low as the ears, is entirely covered with small curls, while those portions which fall down over the shoulders are formed of a great number of small plaits of hair, each resembling the thong of a child's whip; the colour is nearly black, but it has a tinge of brown, which, perhaps, may be attributed to age.

Long hair appears to have been highly prized in the times we are alluding to, by the Jews in particular; but the habit of shaving the head, and supplying its place by artificial means, was one of the Egyptian customs, which they did not adopt during their bondage; on the contrary, they held it in utter contempt.

The Greeks and Romans, the latter people in particular, resorted to the use of artificial hair, although they did not exactly wear wigs. No. 2 represents the head-gear of a Roman lady; the men in general wore their hair short. The Roman ladies, says Strutt, not only anointed their hair, and used rich perfumes, but sometimes they painted it; they also made it appear of a bright yellow colour, by the assistance of washes and compositions made for the purpose, but they never used powder, which is a much later invention. They frizzled and curled the hair with hot irons, and sometimes they raised it to a great height by rows of curls, one above the other, into the form of a helmet; and such as had not sufficient hair of their own, used false hair to complete the lofty pile, and these curls appear to have been fastened with hair-pins.

Persons of rank had slaves to perform for them the offices of the toilet; they held the mirror (*speculum*,) in their hands themselves, to give directions; and Martial tells us, that if the slave unfortunately misplaced a hair-pin, or omitted to twist the curls exactly as they were ordered, the mirror was thrown at the offender's head, or, according to Juvenal, the whip was applied with much severity. It appears, indeed, that a number of women attended on these occasions, for no other purpose than to direct the operation. The married women used a kind of bodkin, which they managed very dexterously, to adjust and divide their hair into two portions, one turning to the right and the other to the left, and by this line of separation the married ladies were distinguished from those who were unmarried. The hair was adorned with ornaments of gold, with pearls, and with precious stones, and sometimes with garlands or chaplets of flowers; it was also bound with fillets and ribands of various colours. The ribands appropriated to the head-dresses of virgins differed from those of the married women.

With the decline of the Roman empire the practice of employing artificial hair fell into disuse, and we hear no more on the subject until about the year 1600; at which time it became the fashion in France to supply the deficiencies of a natural head of hair by artificial tresses, which were sewn on to thin sheep-skin, pared down to the pelt; then thin silk was used for the same purpose; and at last a complete peruke was formed. The word wig is evidently to be derived from the French name *pérruque*, which in some old dictionaries is spelt *perwicke*, thence *periwig* and *wig*. The peruke was, in the first instance, intended to supply a natural deficiency of hair; but, in the end, this article of dress became so necessary to all who aspired to the name of fashionable, that the most beautiful head of hair was frequently sacrificed for the purpose of covering the head with a peruke.

The court of Louis the Fourteenth of France was looked up to, as the "glass of fashion," by the rest of Europe, and this affair of perukes was considered of so much moment, that the king licensed forty-eight *barbiers-pérruquiers* to make this important article for the court, and, at the same time, two hundred others to serve the commonalty. The business increased to such an extent, that the Minister of Finance became alarmed at the quantity of money which left the kingdom to purchase hair in foreign countries, and it was gravely deliberated, whether wigs should not be abolished by law, and caps established in their place; but the pérruquiers having proved, by statistical details, that the export of manufactured perukes produced a greater profit to the nation than the purchase of hair did loss, the wigs gained the day, and the manufacture increased so rapidly, that the number of licenses were increased to eight hundred and fifty, and the members were known under the title of *barbiers-pérruquiers-baigneurs-etuvistes*. They received letters patent, and their officers were hereditary; these consisted of a provost, wardens, and syndics. To this body of men, so essential to the members of fashionable life, the king gave the sole right of dealing in hair, either by wholesale or retail, of making and selling powder and pomatum, preparations to remove the hair, drops for the cure of the toothache, in fact, every application which was intended for the benefit of the head and face. The only parties who interfered with their exclusive privileges were the surgeons; to these men the newly-constituted company could not deny the use of the razor in shaving, for it was a surgical instrument, but to prevent their intermeddling with the art of hair-cutting, it was decided that the insignia of their callings should be different. The surgeon was to hang up for his sign a *copper* basin, and could only paint the front of his house either red or black; on the other hand, the pérruquier was to exhibit a basin of white metal, and could paint the front of his shop of any colour he chose, except red or black. The use of powder was not at first allowed, as the monarch had an antipathy to it, but at length he yielded to the wishes of his courtiers, and permitted a trifling quantity to be sprinkled even over his own perukes.

The expense of perukes in these days was so enormous, that some of the fraternity commenced dealing in second-hand articles, which they manufactured to look like new, and were able to sell at a reduced price. "It is true they were not very durable, but as

they resembled new articles, they were of great service to individuals whose fortunes were small." But to prevent abuse in selling second-hand wigs for new, the dealers were prohibited from establishing themselves in any other part of Paris except the *Quai de l'Horloge du Palais.*

Nos. 3 and 5 are from portraits of the queen of Henry the Fourth of France, and No. 4 from a head of the queen of Charles the First of England. During this period, and until the beginning of the eighteenth century, the men wore amazingly long heads of hair, spreading over the head and shoulders; but at this time hair-powder was used. Towards the close of the century, perukes of the strangest form came into fashion. To illustrate the subject we have selected six examples from French engravings, namely:—

No. 6, *la pérruque à deux queues*, is evidently intended for a man of fashion; No. 7, *la pérruque naissante*, half wig and half natural in its appearance, we may suppose worn by a young man; No. 8, *la pérruque à la brigadière*, was only worn by military men; No. 9, *la pérruque de l'abbé*, was worn by the lay clergy of France, who mixed more with society than the priests themselves; No. 10, *la pérruque à bonnet*, intended more for comfort than show; No. 11, *la pérruque à nœuds*, would become an elderly gentleman, but is more assuming than the last.

COINCIDENCES RESPECTING THE HARMONY OF INHARMONIOUS SOUNDS.

..... some perchance,
Rude singly, yet with sweeter notes combined
In unison harmonious.—GISBORNE.

But cawing rooks, and kites that swim sublime
In still repeated circles, screaming loud,
The jay, the pie, and e'en the boding owl
That hails the rising moon, have charms for me.
Sounds inharmonious in themselves and harsh,
Yet heard in scenes where peace for ever reigns,
And only then, please highly for their sakes.—COWPER.

..... The jay, the rook, the daw,
And each harsh pipe, discordant heard alone,
Aid the full chorus.—THOMSON.

The screams of the jay and the woodpecker, however discordant in themselves, or when out of place, accord admirably with the forest.—WHITE *of Selborne.*

Sounds do not always give us pleasure according to their sweetness and melody; nor do harsh sounds always displease. We are more apt to be captivated or disgusted with the associations which they promote, than with the notes themselves. Thus the shrilling of the *field-cricket*, though sharp and stridulous, yet marvellously delights some hearers, filling their minds with a train of Summer ideas of everything that is rural, verdurous, and joyous.—*The same.*

THE FOOT OF A HORSE is one of the most ingenious and unexpected pieces of mechanism in the animal structure, and scarcely yielding to any in regularity, and in complexity of parts, under simplicity of design. The hoof contains a series of vertical and thin laminæ of horn, so numerous as to amount to about five hundred, and forming a complete lining to it. Into this are fitted as many laminæ belonging to the coffin bone; while both sets are elastic and adherent. The edge of a quire of paper, inserted, leaf by leaf, into another, will convey a sufficient idea of this arrangement. Thus the weight of the animal is supported by as many elastic springs as there are laminæ in all the feet, amounting to about four thousand; distributed in the most secure manner, since every spring is acted on in an oblique direction. Such is the contrivance for the safety of an animal destined to carry greater weights than that of its own body, and to carry those also under the hazard of heavy shocks.—MACCULLOCH.

THE THERMOMETER-STOVE.

A BOOK has lately been published by Dr. Arnott, *On Warming and Ventilating*, the principal design of which is to communicate to the public instructions for making and using what is called by the inventor *A Thermometer-stove.* This stove possesses many valuable properties, and will, unquestionably, be the means of effecting some extraordinary changes in the domestic habits of the people of this country. As it stands associated with one of the most ordinary, but at the same time important, operations on which individual and social health and comfort depend, we present to our readers the following particulars.

Dr. Arnott is well known as an eminent physician, a popular writer, and a practical philanthropist. He has already gained the thanks of the medical profession by permitting the unrestricted use of his *water-bed*, and in the present instance is equally entitled to the respect and gratitude of all classes. The Thermometer-stove is equally adapted for the cottage and the mansion, and with a liberality which does him honour, its inventor has given to the public the full benefit of his labours.

Before we describe Dr. Arnott's stove, let us offer a few brief observations on the two modes of heating, which, for domestic purposes, are those generally adopted in our own country. And first of all, we refer to the *open fire-place*, in which peat, wood, or coal, are used as fuel.

For the sake of more simple illustration, we limit our remarks to an open coal fire; the kindling of which is a somewhat tedious and wasteful process. But let us suppose the fire to be perfectly alight and burning briskly. It surely cannot escape observation that a valuable portion of the fuel is passing away unconsumed, namely, that which ascends the chimney in the form of smoke. At certain intervals, the fire of which we speak requires poking, trimming, and refreshing, by additional supplies of fuel. If it happen that we have a good fire, when fresh fuel is laid on, the waste will bear some proportion to the quantity of ignited fuel already in the grate as compared with the fresh supply. Sometimes the latter will be speedily vaporized, as when we have a blazing fire; at other times waste will occur by coal falling through the grate before it is properly ignited; whilst it not unfrequently happens, that by fuel injudiciously applied, either as respects the mode or the quantity, a good fire is suddenly converted into a dull one, which, unless carefully tended, will soon be extinguished.

On a moderate calculation, it is estimated that, from the causes just mentioned, one-fifth part of all the coal used for domestic purposes is lost to the consumer. And this is unavoidable even with careful management. Where cinders and small coal are thrown on the ash-heap, the proportion is, of course, much greater.

But the waste of *fuel* is a trifling consideration in comparison with that of *heat.* The abundant supply of coal with which in this country we are favoured, and its consequent cheapness, is one of the principal causes of the long-continued use of an open fire. Far be it from us to undervalue the comforts of an English fire-side, or to appear insensible to the many delightful associations connected with it. The existence of these we admit, as we do also their influence upon the national character. But dismissing our prejudices on this subject, we believe it will be found that the advantages of an open fire are not so great as we imagine, and that even its comforts are pretty equally balanced by its inconveniences. Hence we cannot but venture the opinion, that, by and by, we

(or at any rate our successors) shall become equally attached to more rational and more economical modes of warming as we are now to those in common use.

We have said that the waste of *heat* by an open fire greatly exceeds that of fuel. In an ordinary fire-place, whatever be its form, the quantity of air which passes by, or over, the fire is much greater than that which passes through it. We need hardly remark that the combustion of the fuel depends on an uninterrupted supply of air, and the more rapidly the air circulates amongst the ignited fuel, the greater is the quantity of heat liberated in a given time.

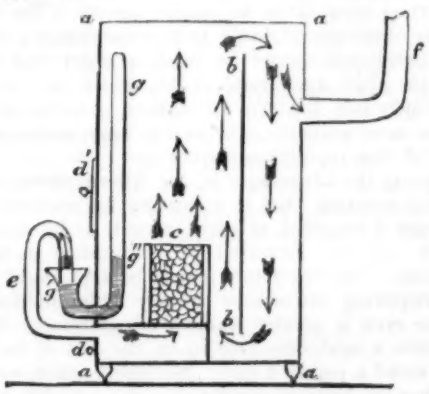
A condition essential to the operation of an open fire is, that it be placed almost immediately under a flue communicating with a chimney, which flue must, in some respects, correspond with the size of the fire-place. To insure sufficient draught in the flue to make the fire burn, and to carry off the smoke, a current of hot air must be constantly ascending it. Any defect in this part of the process occasions what is very justly considered a nuisance, namely, a smoky apartment. To the situation of the fire, and the quantity of air permitted to pass over it, may be attributed the loss of heat of which we complain. Under the circumstances just described, the heat which enters the room is only what is radiated from the front of the fire. By its means the air immediately surrounding the fire has its temperature raised, but the moment the door of the apartment is opened, the air thus warmed is propelled into the chimney, and several minutes must elapse before the air which gained admittance will be warmed to the same temperature as that which was so suddenly driven out. Hence it is, that however comfortably an apartment may be fitted up, if it be warmed by an open fire, the temperature of the air within it is partial and unequal. We naturally turn towards the fire for warmth; but who can deny that the nearer they approach the fire the more difficult is it to keep warm that part of the body which is turned away from it?

In the best constructed houses, the crevices in floors and around doors and windows permit the entrance of more air than, under ordinary circumstances, is sufficient for all the purposes of warming and ventilating. The quantity of air required for the combustion of fuel, when that fuel is economically employed, is almost inconceivably small. But in an open fire-place, in proportion that the fire is enlarged, so much the more rapid will be the motion of the hot air in the chimney; a process which necessarily implies the access of an equal quantity of cold air to the room. Thus we may often notice when there is a large fire in a room, the air will make a *whistling* sound in passing through a key-hole; but the sound ceases when the intensity of the fire has abated. It can be satisfactorily proved, that by an open fire, at least three-fourths, and in many cases, seven-eighths, of the heat produced from a given quantity of fuel are absolutely wasted by being permitted to ascend the chimney.

Another mode of heating, and which is adopted very generally in entrance-halls, shops, offices, and public buildings, is by means of the *hot-air stove*, which consists of an enclosed fire-place surrounded at the back and sides by an iron case, between which and the fire-place air is permitted to circulate, and consequently becomes heated. By this stove less heat is wasted than in an ordinary fire-place, but there are several objections to its use, of which we mention the following.

The hot-air stove requires a good deal of attention: almost as much as an open fire. It is liable to be heated red-hot; the salubrity of the air which comes in contact with it being thereby impaired, whilst an odour peculiarly disagreeable is diffused throughout the apartment in which it is placed. There is danger attending the use of this stove, unless the pipes by which it communicates with a chimney or the external air are fixed at a proper distance from wood and other inflammable materials. To the neglect of this necessary precaution, in conjunction with carelessly over-heating stoves of this kind, we may attribute some of the most extensive fires of recent occurrence.

The stove invented by Dr. Arnott differs essentially from the common hot-air stove, and still more from an open fire-place. But let us describe it; and in doing that we shall find that the following sketch will materially assist us. It represents the stove with one of its sides removed, so as to exhibit its interior arrangements.



The outlines of the figure, *a a a a*, represent the case or body of the stove, which might be formed either of cast or sheet iron. It is divided into two chambers by the partition, *b b*; but in such a way that there may be a free communication at the top and bottom. *c* is a small furnace, or, as it is called by the inventor, a fire-box, made of iron, and lined with fire-bricks. The fire-box is not in contact with the exterior case of the stove. It communicates at the bottom with an ash-pit, the door of which is at *d*, —that of the stove, by which the fuel is introduced, is at *d'*. Both these doors must fit very accurately. Above the door of the ash-pit is a bent pipe *e*, by which air gains admittance to the fire.

A fire being kindled and the doors at *d d'* shut, the only way in which air has access to the fuel is by the pipe *e*; the air so admitted, passing through the fire before it enters the upper part of the stove. That portion of the air not required to aid the combustion of the fuel having reached the main body of the stove, and there mixing with the smoke and other products, they circulate slowly in the directions indicated by the arrows, and at length pass into the chimney by the pipe *f*.

The slow movement just mentioned as taking place within the stove may well be contrasted with what happens in an open fire-place. In one case the greater part of the heat produced is rapidly carried off by a current of air ascending the chimney—by the Thermometer-stove it is detained until almost the whole of it has been diffused throughout the apartment.

The bent tube *g* terminating in a cup-shaped opening at *g'*, is a self-regulating valve. The tube is closed at the end *g* within the stove. *g' g''* represents mercury which occupies the bend of the tube. When the fire in the stove burns too briskly, the air in the tube occupying the space between *g* and *g''* is ex-

panded, and by expelling some of the mercury from the tube at g'' into the cup at g', it closes the aperture of the pipe e; thus cutting off the supply of air to the fire. In a few minutes (the fire in the mean time having abated its energy,) the air in the tube will return to its former dimensions, and the mercury subsiding in the cup, air is again permitted to enter the ash-pit.

The stove, of which we have thus attempted to convey a general idea, may be made of any required form or size. Instead of the self-regulating air valve just described, it is fitted up with others of a very simple construction, and which admit of being adjusted with the greatest accuracy by the hand.

We have seen Thermometer-stoves of various forms, some of them very beautifully designed, in operation. We have attentively watched the process going on within them, and have made ourselves acquainted with their capabilities as heating agents. The result of our observations leads to this conclusion; that if the Thermometer-stove be made in strict conformity with the plain and simple rules which are so perspicuously laid down by Dr. Arnott, it will prove one of the most economical as well as most useful inventions of this rapidly improving age.

Among the advantages of the Thermometer-stove, we may mention that it maintains an uniform temperature if required at night as well as by day, but which can be increased or diminished in a few minutes. The fire within it may be kept alight without requiring attendance or any additional fuel for ten, or even a greater number of, successive hours. To warm a moderate-sized room, the cost of fuel will not exceed a penny a day. No smoke, dust, vapour, or other products of combustion, can possibly escape into the room. The air is warmed, not heated, and hence it is not deprived of its health-preserving properties. There is no danger attending the use of the Thermometer-stove; it is more easily managed than an open fire; and there is no waste either of fuel or of heat.

He who can imagine the universe fortuitous or self-created, is not a subject for argument, provided he has the power of thinking, or even the faculty of seeing. He who sees no design, cannot claim the character of a philosopher: for philosophy traces means and ends. He who traces no causes, must not assume to be a metaphysician; and if he does trace them, he must arrive at a First Cause. And he who perceives no final causes, is equally deficient in metaphysics and in natural philosophy; since, without this, he cannot generalize,—can discover no plan, where there is no purpose. But if he who can see a Creation, without seeing a Creator, has made small advances in knowledge, so he who can philosophize on it, and not feel the eternal presence of its Great Author, is little to be envied, even as a mere philosopher; since he deprives the universe of all its grandeur, and himself of the pleasures springing from those exalted views which soar beyond the details of tangible forms and common events. And if, with that presence around him, he can be evil, he is an object of compassion, for he will be rejected by Him whom he opposes or rejects. —Macculloch.

Compassion.—Compassion is an emotion of which we ought never to be ashamed. Graceful, particularly in youth, is the tear of sympathy, and the heart that melts at the tale of woe; we should not permit ease and indulgence to contract our affections, and wrap us up in a selfish enjoyment. But we should accustom ourselves to think of the distresses of human life, of the solitary cottage, the dying parent, and the weeping orphan. Nor ought we ever to sport with pain and distress, in any of our amusements, or treat even the meanest insect with wanton cruelty.—Dr. Blair.

Honour.—He is worthy of honour, who willeth the good of every man; and he is much unworthy thereof, who seeketh his own profit, and oppresseth others.—Cicero.

ON EMPLOYMENTS WHICH INJURE THE EYE-SIGHT.

No. II.

FUNCTIONS OF THE EYE—ABUSE OF THE ORGANS OF THE SENSES—CAUSES BY WHICH THE EYE-SIGHT IS IMPAIRED.

Having already described the chief parts and functions of the eye, and its appendages, we come now to consider how it is that this apparently elaborate apparatus performs its office. A pencil of light, that is, a bundle, or collection, of rays proceeding from any luminous object, falling upon the cornea, enters it, and is refracted or bent in its passage through the aqueous humour, by which means the rays of the pencil are brought nearer to parallelism; such of the rays as can pass through the pupil are further refracted by the crystalline lens, and the rays are now no longer divergent, that is, they do not spread out *from* a point, but begin, in passing through this lens, to converge or proceed *to* a point, and this convergency is perfected by means of the vitreous humour, which brings the converging rays to a point exactly when they reach the retina. This process is undergone by every pencil of rays proceeding from any object to which the eye is directed, and an exact image of such object is depicted on the retina. If this convergent point do not quite fall upon the retina, but before it, in the vitreous humour, the eye is said to be short-sighted; if, on the contrary, these convergent points fall beyond the retina, the eye is then long-sighted; but these and other defects to which the eye is subject, will be discussed at greater length hereafter.

What we have above stated is the grand and important element in distinct vision; the convergence of the rays of a pencil to a point on the retina. An admirable adjustment of parts and of degrees of refractive power in the different humours of the eye produce this perfect convergency, and the mind can sufficiently appreciate and understand the mechanism and purposes of all this exquisite arrangement,—but here we have attained the utmost limit of our knowledge,—we have traced upon the retina a picture of the forms presented to the eye,—we see that this retina is an expansion of a nerve called the optic nerve, which proceeds from the retina into the brain, the seat of the mind;—but how the mind receives its impressions of light through the medium of this optic nerve, is a question that has never been answered, and probably never will be answered. The student in science is constantly presented with certain barriers beyond which he may not pass,—with certain limits to the inquiring powers of his mind, when subjects such as these are presented to him, which admit neither of demonstration or of analogical inference, and are therefore beyond the purposes of physical inquiry. Let him not, therefore, deal in vague conjectures, which, however ingenious, must still be unprofitable; but rather let him turn to the immense field which has already been cultivated so successfully, and from whence rich harvests of knowledge have been gathered. We cannot join in the utterance of the querulous opinion, which, because there is much that is unknown, denies the existence of any knowledge at all; nor could we ever assent to the conclusion of the philosopher, who said that his long life of study had taught him that he knew nothing; on the contrary, we can assure the reader, that the arena of modern science is so extensive, that a very long life and untiring industry, would be inadequate to a fair investigation of its contents.

The reader will now have some idea of the me-

chanical structure of the eye, and how, as far as we know, this structure assists the powers of vision. We come, therefore, to the more direct purpose of our subject, namely, the consideration of those employments of the eye by which its powers are impaired or destroyed. And here we must remind the reader of another law of nature as remarkable and beautiful as any one in her code, if we may be allowed such an expression, where all appear alike beautiful and remarkable when we are quite sure that we read and interpret them correctly; it is this—that the perfect action of all the faculties, whether mental or physical, can be assured and perpetuated only by allowing them certain periodical intervals of perfect repose. Now this may appear to be a truism, so perfectly well known, that the necessity for its enunciation in this place may be questioned by some: but we must remind our readers, that a principle is as important in its nature as it is unbounded in its application; that it is the business of science not only to discover principles, but to trace them to effects where their presence is, perhaps, in no way suspected; that we often recognise the action of a principle in a few effects to which we are most obviously exposed, but we are often slow to recognise the same principle in effects which afford us a larger amount of pleasure or profit on the one hand than of pain on the other, which minister to our cupidity, our pride, our vanity; or which flatter one of those "sins which do most easily beset us;" and, indeed, we are frequently unable, from ignorance of the extent of a principle, to apply it as a cause to effects, which we often think have no cause at all, or at least a very remote one, which, if discovered, we pronounce to be irremediable. But this sort of argument is unjust and unreasonable: in nature there are only a few principles or first causes; some of these we are cognizant of—to all of them we are subject: our business, therefore, is to study the code of laws by which we are governed, to conform with the strictest obedience, since rebellion meets with certain punishment, which, if ever it can be removed, is removed only by a return to obedience.

The senses, then, require perfect repose in order to their perfect action, and this repose implies a removal of every cause which excites them to action. By the perfect action of an organ, we mean its legitimate use and employment; the snuff-taker abuses his organ of smell, and its functions are manifestly impaired. The manufacturer of perfumes is a bad judge of odour from the same cause. A nauseous smell ceases to be nauseous unless it is judged of at intervals. The sense of hearing is subject to loss of power from abuse of its functions: a man accustomed to the din of noisy factories, and who sits down undisturbed by and even unconscious of the presence of that disturbance, which to a stranger is, at first, insufferable, is scarcely conscious of delicate sonorous impulses. Blacksmiths hear soft tones with difficulty, and examples have been abundant of old artillerymen who have become quite deaf from the long practice of their profession. The sense of touch is less perfect in the ploughman than in the watchmaker, and most perfect, perhaps, in the blind man, who by its means supplies in a great measure the loss of sight.

Taste also may be abused: the excited reveller scarce distinguishes the flavour of his "liquid fire," as the banquet approaches its end, and the pampered epicure is gratified only by allowing to his palate intervals of repose. The eye exhibits this principle in a beautiful manner. In its healthy state its function is being constantly intermitted in the process of winking, as also by moving it about towards different objects: if the eye be kept open and rigidly fixed upon one object, its visual power rapidly declines.

There is so much sympathy between various physiological structures, that it often happens that a morbid or diseased action of one structure will seriously interfere with the functions of other structures which are healthy. In the healthy eye, the retina, the crystalline lens, the ciliary nerves, and the pupil, must harmonize in their action: the many diseased affections of the organ which include weakness or indistinctness of vision, result from a weak state of the retina, from the disordered action of the iris and ciliary apparatus; this is brought about mainly by inflammation of the eye or its appendages, resulting from injudicious use of the organs.

To discuss all the diseases of the eye resulting from abuses of its function, is manifestly a subject for a large medical volume, the study of which belongs to the medical pupil alone:—our purpose is more confined: we intend to point out some of the cases of every-day occurrence, wherein the organ is injured by an habitual irritable treatment. We do not intend to employ technical terms, except a few, which may be necessary to the comprehension of our subject, and still less do we pretend to direct remedies, except by pointing out causes of injury to the eye. In most cases our purpose will be effected, when, having clearly traced an ill effect to its cause, we say, remove or mitigate the cause, and the effect will probably cease.

In the pathology of the eye the term *amaurosis* is employed, in which is comprehended all those imperfections of vision resulting from a morbid action of the sentient apparatus belonging to this organ. The term amaurosis is derived from a Greek word signifying *to darken*, and implies partial or total loss of vision, according as the optic nerve, or retina, is partially or totally paralyzed. This injury, or paralysis, is not generally manifested by external symptoms, and is therefore clearly distinguished from cataract, opacity of the cornea, and closed pupil. This disease is due to a variety of causes which it is not our business to discuss; such as disorganization of the retina, vascular turgescence, injury of certain nerves, &c. Our purpose is, as we have already stated, to point out those common causes, of every-day occurrence, which the exercise of many arts and professions is calculated to induce, and these causes may be conveniently arranged into five heads, namely:—

1st. Sedentary employments in which the head is bent over work of various kinds; including those cases in which the eye is customarily employed on minute objects.

2nd. Where the eye is employed upon too strong or too little light: upon polished or reflecting surfaces.

3rd. The habitual exposure of the organ to high temperatures.

4th. The habitual exposure of the eye to acrid fumes.

5th. The customary employment of optical glasses.

By the light of Divine revelation, Christianity enables us accurately to discriminate between good and evil, right and wrong: it teaches us to see things according to their own nature and in their proper colours: to behold those qualities which are really vicious, deprived of the dazzling brightness, wherewith reason, impaired by passion, had invested them; and to contemplate those which are virtuous, disencumbered from the clouds of worldly prejudice, and arrayed in their native beauty. In a word, it teaches us to see things, as they are in the sight of God, and not as they appear according to the erroneous conception of men.—Bishop Mant.

ON THE PERPETUATION OF PLANTS.

THE care which the Creator has bestowed on the perpetuation of plants offers a wide field of inquiry. The collateral as well as the direct means of propagation are very numerous, and the results very extensive and valuable.

The circumstance which is, perhaps, most striking in the mode of propagation by seeds, is the apparent anxiety for their production, in the means adopted. This is less sensible to common observation, where the magnitude, the duration, and the uses of the plant itself, are conspicuous; but it becomes striking in the smaller and more perishable ones, and is often very remarkable in the lowest parts of the scale. Thus in the oak, we pay little attention to the production of seeds; or if noting it, we still know that there is before us a being, destined to a life of so many centuries, that we scarcely think of its death, or of the necessity of a system of perpetuation.

It is in the biennial and the annual plants that this anxiety for the continuation of the races is most obvious to common observation. Millions of individuals seem to be utterly worthless: and there are even species without end, for which we can discover no use, though desirous to find at least an insect attached to each. Amid the hundreds of lichens and mosses, a very few would, as far as we can see, have fulfilled the purpose which they appear solely to serve, in producing soils on naked surfaces. Yet in these we trace the same care and the same anxiety. The annual seems to grow for no other purpose than to produce seeds; and that being accomplished, it dies. For this it struggles against every difficulty: and under every check, every accident, every mutilation, it still labours for this end, as if it were a conscious agent. We cut off its flowers, or cut down itself, obstruct, impede it, in every manner, but it still resists, proceeding with an obstinacy of determination to effect this great object; while if, tired of opposing it, we cease, it recommences, and having at length gained its purpose, dies. We can often even prolong the annual life for another year, or more, by the same opposition; as if it was determined not to part with existence till it had obeyed its orders and fulfilled its destiny.

The first mark of care, if a remote one, is found in the contrivances for protecting the future flower through the Winter, wherever such protection is necessary. In the buds, the beautiful packing, the investing scales, the down or hairs in some cases, and the varnish in others, are familiar: and, by these contrivances, aided by that vital power, the action of which in resisting cold has not been explained, the most complete protection is afforded. In the bulbous-rooted plants, the bud is not less effectually protected beneath the ground, partly by the depth of earth, and partly by the singular chemical properties of the coverings, aided by the same resisting vitality.

In other cases, the flower bud is not produced till the frosts are passed; and our attention may now be directed to the provisions within it for the formation and ripening of the seeds. In a certain sense, indeed, the flower is a superfluity, an example of gratuitous beauty, while it also contains provisions for the feeding of insects; yet with these are always combined some uses for the seed itself, as, in many cases, they are so numerous and remarkable that they cannot be overlooked. The reader need only be reminded of the various ways in which they protect the essential parts of the fructification, the stamina, and the pistils, on which the future seed depends; and of the contrivances for bringing the pollen into contact with the latter.

The essential protection which the calyx affords, by enveloping everything while yet in a tender state, must not be forgotten; apt as we are to look on it as a superfluous part, from attending only to the expanded flower. It would be endless to point out the numerous forms and modes under which it guards the unopened flower, and above all from the access of water. The calyx of the rose, so useless when expanded, is a familiar instance of protection afforded by a structure which, compared to the purpose, is very inartificial; and yet in this, and all similar forms, that protection is complete. In the cistus, possessing a flower of unusual tenderness and delicacy, a varnish is superadded, for the purpose of warding off the rains. The monophyllous calyces present a structure more apparently efficacious, yet the protection is not more complete. And if the scale calyces of the grasses offer a much simpler contrivance, the security which they afford is not the less perfect. The calyx of the poppy is lax, and not very firmly closed; but as a counterbalance to this, the flower bud is bent down by a curvature of the stem, and erects itself only when the protection of this deciduous guard is no longer wanted. The obstinacy with which this bud refuses to flower till it can erect itself, belongs to a still more interesting circumstance in the physiology of plants: but under the present view, the inverted position enables the back of the calyx to ward off that water which might have penetrated the less perfect junction at the summit.

That provision may here be pointed out in the liliaceous flowers, which, as a sheath, forms the substitute for the absent calyx, while the leaves also are sometimes arranged to perform the needful function. Under many different modes, the tulip, the genus Allium, the grasses, and far more, will afford examples of protection, given either to supply the want of a calyx, or to add to the security which that affords. And thus the seeds of the mosses are so embosomed in the plant, at first, as almost to elude the botanist; while they escape the chance of injury; to be elevated for dispersation, only when all hazard of failure is past.

It is under all this care and concealment, that the essential parts, destined to produce the perfect seed, are growing within; free from all hazard, till the expanding flower opens to the light that the work may be completed. And then do we begin to perceive the utility of many other preparations towards this great end, the purposes of which we might not have understood before, and which he who looks on this interesting part of creation with a common eye, never sees. The vanity of philosophy may smile, if it pleases, at what it may choose to term fanaticism, but it is he who seeks for the hand of the Creator in every one of His works, who has found the true clue of investigation; since the purpose is that clue, and, that to study the design and the Designer, are one. And if the care of a parent for its offspring, the anticipations, the preparations, the watchfulness of a mother, are objects of our admiration, shall we not at least investigate the contrivances, the thought, the anxiety, of the Great Parent of all, for the safety and the life of these, His beautiful, but His lowest children; not inquire of his care for their perpetuity, that not one shall be lost? Could more have been done; and if He has not done it, by whom then was it effected? Who is it that contrived, who is it that watches over the lilies of the field, that not one of them should perish from his land? Who is it that guards to maturity, even the minutest moss, and ensures it a posterity, that it shall not fail from the multitude

of His children, who, even in the vegetable world, look to Him for their food, their life, and their enjoyment? Was it He: and is it He who cares not for man, provides not for him, governs him not, watches him not? Be it so, if it can afford satisfaction to think that so it is: but it will not be so to him who will open his eyes on the world around him, and who has learned, in everything, to look to the Cause, the Parent, of the universe. Would that I could persuade him who has hitherto walked through creation without eyes, without thought, without a heart, to take into his hand the first flower that shall present itself, and examine it as the work of some Being at least who intended, and wrought, and cared. If eloquence has long done its worst for this unfortunate cause, there must be one who can sit down with the next flower that meets him in his Summer walk, and ask himself, Whence came this, why is it here, why all this beauty, why all this care? I have seen it rise from a minute seed, I trace a series of cares and contrivances that seed shall spring from it again, I trace these under a thousand forms, I marvel at their ingenuity and their wisdom, I am astonished at an anxiety which has neglected nothing, I see that an end was intended, and I find that end attained. What more does man ever do to attain his objects, when does he labour with more care and more knowledge, and when does he succeed with more certainty? Does woman show more anxiety, more contrivance, for her offspring, than the Parent of this little flower has displayed? And who can that careful, that affectionate parent be? No one! Even so was it no one that reared me from helplessness to maturity, I knew no parent's thought, no mother's care: there is no God. Can such a conclusion ever have entered the heart of man? We know not how to believe him who has declared it.

[*Abridged from* MACCULLOCH'S *Proofs and Illustrations of the Attributes of God.*]

THE CAMERA LUCIDA.

THE Camera Lucida, an invention of Dr. Wollaston, like the Camera Obscura, is an instrument employed in making copies of drawings, and in portraying distant objects; but it is of greater service than the Camera Obscura, being much more portable, and, if properly used, reflecting the image of the object without the least distortion.

If a piece of thin glass is held at an angle of forty-five degrees with the horizon, at a small distance from the table, and a sheet of white paper is placed immediately beneath it, the reflected image of an object before it will be visible, by looking downwards upon it; and as the glass is transparent, the hand and pencil can also be seen, and an outline of the image can be made upon the paper. In this case the image is inverted. Such an instrument as this can be made off-hand very easily. Let B be a piece of thin plate-glass, about an inch and a quarter long, and three-quarters of an inch wide; A a piece of wood in which the glass is fixed, and C a piece of pasteboard with a small hole in it, forming an eye-piece to keep the eye directed to one point. Let this little instrument be fixed on the top of a small stand, and you have a Camera Lucida of the simplest construction, but possessing the disadvantage of reflecting an inverted image.

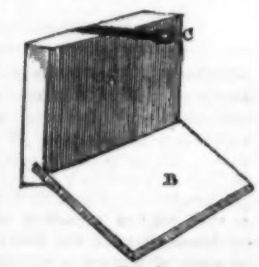


Fig. 1.

But the inversion can be corrected by taking a little more pains. Let A be a piece of looking-glass fixed in a wooden or brass frame, and connected with a piece of clear glass, B, so that the angle C B A shall be an angle of one hundred and thirty-five degrees, the image of an object placed at F will be reflected from the looking-glass at A, and proceed to the clear glass at B: from this it will be reflected upwards to the eye at G, and the glass being transparent, the image and the hand will be seen at the same time; in this case the image is erect. But, in general, neither of these plans are resorted to, for in both cases, as there are two reflecting surfaces from the glass, there will necessarily be two reflected images, one of them certainly much less vivid than the other, but still sufficiently visible to distract the eye

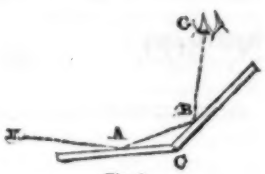


Fig. 2.

The optical portion of the Camera Lucida which is usually sold consists of a prism. Fig. 3 is a section of the prism employed; the angle A is equal to 22½ degrees, C to 135 degrees, D 22½ degrees, and B is a right angle of 90 degrees. The solid nature of the prism will not allow the hand to be seen through its thickness, and the instrument is used in a different manner to the last contrivance. A is the prism, B a moveable piece of brass, having a small eye-hole in it at B; the reflected ray from C is received near to this corner of the prism, and reflected upwards to the eye; the eye-hole is so adjusted that one-half only is over the prism, the other half leaves a free space through which the hand and pencil can be seen. In using the instrument a vast deal depends on the proper adjustment of this eye-hole.

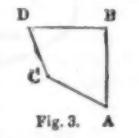


Fig. 3.

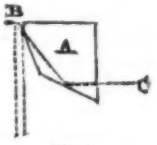


Fig. 4.

If the light is very powerful on the object, and much less so on the paper, the part of the prism exposed through the hole should be small, and the opening through which the paper is seen large in proportion. On the other hand, if the light on the drawing is weak, a larger part of the prism must be uncovered. In copying a print, great care must be taken that the print itself is perfectly flat and perpendicular to the horizon, and that the side of the prism at B A, fig. 3, which is opposite the print, shall be parallel to it. If this is not attended to, the print will be thrown into perspective and the copy be distorted.

If the object is to be copied of its natural size, its distance from the prism in front must be equal to the distance from the eye to the paper; if it is to be reduced it must be placed at a greater distance; if to be enlarged, it must be brought nearer.

The Camera Lucida has been fixed to the eye-hole of a telescope or a microscope, in such a manner as to allow the objects within the field of vision to be copied on paper.

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